Space Weather Forecast

Issued on Sunday, 20 March 2022 at 00:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor geomagnetic storms on Day 1 (20th March).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar Activity has been Low, with only one minor Common-class flare, originating from AR2965 in the northwest quadrant. There are now two numbered sunspot regions on the visible disc; the largest region in the northwest quadrant has reduced its magnetic complexity and has shown some fading of the trailing spot. Three new and currently unnumbered sunspots have emerged, these are all small and simple. No Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: Solar winds remained at background levels. The Interplanetary Magnetic Field (IMF) was weak, though increased towards the end of the period, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be at mostly Low or Very Low levels with an ongoing slight chance of an isolated M-class flare, mainly from the large region in the northwest. This chance reduces on Day 2 (21 March) as this region rotates off the west limb.

Solar Wind / Geomagnetic Activity: Solar winds, currently at background levels, are expected to increase on day 1 (20th March) to perhaps 500 km/s. This is due to either the CME from an eruption on March 16th which may give a glancing blow early or a possible coronal hole fast wind.
Geomagnetic activity is expected to be mostly Quiet to Unsettled (Kp 2-3) to start. The CME arrival and/or fast wind arrival will give an increased likelihood of Active (Kp 4) intervals, and a chance of G1/Minor (Kp 5) geomagnetic storms, mainly on Day 1 (20 March). From days 2-4 (21st-23rd) geomagnetic activity is expected to return to predominantly quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	10	5	5
Strong	G3	No	2	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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